MARINE REVIEW.

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Time Schedule for the "Flyers."

According to the schedule issued by the Northern Steamship Company for its new passenger line, the steamer Northwest, which is expected to leave Buffalo on her her first voyage on June 5, will make the round trip, Buffalo to Duluth and return, in 5 days and 9 hours. The actual running time, according to the schedule, for the round trip of about 2,000 statute miles, is 113 hours, so that the ship will be required to make on the entire trip, with checks in the rivers included, an average of 17.7 miles an hour. The schedule for the first boat as now arranged is as follows:

STEAMSHIP NORTHWEST, BUFFALO AND DULUTH, COMMENCING WITH TUESDAY, JUNE 5.

Leaves Buffalo Tuesdays	9 p. m.
Arrives Cleveland Wednesdays	5 a. m.
Leaves " "	8 "
Arrives Detroit "	2 p. m.
Leaves " "	3 "
Leaves Sault Ste. Marie Thursdays	12 noon.
Arrives Duluth Friday	8 a. m.

RETURNING.

Leaves Duluth Fridays	4 p. m.
" Sault Ste. Marie Saturdays	12 noon.
Arrives Detroit Sundays	10 a. m.
Leaves " "	11 "
Arrives Cleveland "	5 p. m.
Leaves " "	8 "
Arrives Buffalo Mondays	6 a. m.

It will be seen from the schedule that the stops at Cleveland and Detroit, on both eastern and western trips, will amount to only three hours at the former and one at the latter port. The schedule has also been arranged with a view to running the rivers by daylight on up and down trips. Leaving Buffalo by night, Tuesday, the ship arrives in Cleveland in time to start across Lake Erie at 8 o'clock the following morning, and with a stay of only one hour in Detroit she will be on Lake Huron Wednesday night and in the Sault river Thursday morning. On the down trip the time is also suited to the same advantages for the enjoyment of scenery by passengers. Among the company's announcements is one to the effect that it is expected to have the Northland, the second boat, in commission about Aug. 1. The Northwest will leave Buffalo on her last trip for the season, Tuesday, Oct. 9.

A full passenger tariff has been officially announced. The rate from Buf- Buffalo to Duluth is $17 one way, or $30 for the round trip. This does not include berth or meals. Single berths on the saloon deck for the trip one way range from $4.50to $7.50, and $8 to $9 50 on the hurricane deck, so that the trip one way,can be made for $21.50 to $26.50, exclusive of meals,which are served *a la carte*. For passengers desiring special accommodations, a room with double bedstead, bath and closet on the hurricane deck will cost $24, and there are also parlor rooms on the saloon deck accommodating six persons and costing $33.

Among the local rates, exclusive of berth or meals, are the following: Buffalo to Cleveland, $3; to Detroit, $5; to Sault, $9; to Duluth, $17. Cleveland to Detroit, $2.25; to Sault, $6; to Duluth, $14. Detroit to Sault, $5; to Duluth, $12. Sault to Duluth, $8.

By connecting at the Sault with the Lake Michigan & Lake Superior Company's new passenger steamer Manitou, the Northern company expects to do a large passenger business between Buffalo, Cleveland, Detroit and Chicago. A special time card for Chicago business has been prepared, and the relations established between the two companies are evidently of a very close kind.

Naval War College.

As it is more than probable that the United States Naval War College will give some attention during the coming summer to a study of the lake portion of the coast system of the United States, probably to the extent of a visit from the class, the shipping interests of this part of the country should use every effort to have congress pass the necessary appropriation for the maintenance of this most important institution. The United States Naval War College, located on Coaster's Harbor island, Newport, R. I., is one of the most important of the many excellent government institutions. This college was established several years ago under the superintendency of Captain Mahan, United States navy, whose writings, particularly "The Influence of Sea Power on History," have become standard books of reference abroad. The present superintendent is Captain H. C. Taylor, United States navy, whose high standing and ability are well known outside the navy, as well as to the service at large. Capt. Taylor is one of the original developers and directors of the Nicaragua canal. One of the fundamental principles of a military organization is "in time of peace prepare for war," and this is the object of the Naval War College.

The personnel of the United States navy has no superior in education or intelligence, but it lacks experience in the modern implements of war. It was the recognition of the necessity for a post graduate course for all officers who may in the future be called upon to command our ships, that caused the establishment of the Naval War College. The new ships with their modern batteries and engines are the schools where most of this experience must be gained,but the Naval War College is the only place where practice and theory is combined in the preparation for war. The immense extent of unprotected sea coast makes the preparation of plans of defense imperative, for modern fleets move so quickly that an enemy might obtain possession of important bases of operation, before a plan could be formulated in time of actual warfare. It was the completeness and detail of the German plans—formulated years in advance—that gave them the easy victory over the French in the Franco-German war. Realizing these facts, Captain Taylor has prepared a most interesting programme of instruction for the next session, which begins in June and lasts until October. This course will combine both theory and practice. The class under instruction will include officers of all grades who can be spared from active service. The following is a sketch of the proposed summer course:

"The governing principle will be a 'Problem' of warfare. This problem will be under the consideration of the class during the whole term, and each officer will be invited to offer a solution at the close of the term. This problem is the topic, toward the solution of which all the summer work (except in international law) will be directed. The lectures, the practical exercises, the personal examination of localities, will be so arranged as to converge throughout the course toward this problem at the close. In other words, such things will be learned and practiced as will better enable the officers to thoroughly master the material situation presented in the problem.

"The operations to be considered are to be divided for convenience into the three branches of strategy, tactics, and naval coast defence. Under these heads fall minor subjects to be studied and discussed, such as signalling, torpedo tactics and tactics of the ram; camps and operations on shore of our seamen and marines; types of ships to be used in the problem; strong bowed vessels for ramming; heeling of ships after being rammed; types of yachts and tugs for torpedo boat catchers and scouts; how to improvise rams from vessels in vicinity; floating work shops; cleaning bottoms; types of engines of ships in the problem; boilers struck by enemy's shot; dislocation of boilers or engines when ramming; accidents to torpedo boat engines; quick delivery of coal from bunkers to furnaces in action; economy of coal; possibilities of liquid fuel; how best keep ready to move without undue expense of coal; best coal attainable for campaign. Other minor subjects too numerous to mention have reference to hospital service,transport of men,guns and machinery,importance of naval reserve in campaign, etc."

The general system of the summer course will therefore be a course of lectures in international law and also a series of lectures and exercises, treating in the beginning of the different branches of the art of war in their general aspect, their history and their fundamental principles. As the class advances, the lectures and exercises will be concentrated upon those historical examples and principles which illustrate the conditions of the problem. Finally, the latter part of the course will be devoted to the actual problem itself. The lecturers will give the needed strategic data. Constant practice with the war games will give the mental practice required. Personal examination of the various localities will correct errors due to use of charts alone, and free but methodized discussions among the members of the class will materially assist in forming correct judgments.

Probably no portion of the extended coast system of the United States requires such close study as the great lakes. All other portions are well known to officers of the navy, but this section is a sealed book to all except the few who have served on the U. S. S. Michigan. It is needless to refer to the proximity of England, (Canada) and her possession of the only canals by which war vessels can enter the lakes, or to the fact that lake cities are without protection from an enemy. These facts are well known to all familiar with the lake region.

The Naval War College is established for the express purpose of studying these conditions, and of preparing plans for such emergencies as may arise. As a personal visit of the class to the sections of country involved in the problem for protection is a part of the course, it is evident that much good will be done by this series of investigations.

Engineering Subjects.

CONDUCTED BY GEO. C. SHEPARD.

ECONOMICAL PROPULSION.

An absorbing and vexatious problem among the vessel owners and managers in these times of low freights is the reduction of operating expenses,and a method by means of which the coal bill could be reduced would be hailed with delight. It is hardly possible with the well-designed expansive engines and efficient boilers now in general use here to make any alterations or additions that would affect the coal consumed, and it has probably occurred to most people interested in steamboats that there is a speed for every boat and every draft of that boat at which the coal consumed per mile is the least that will carry that boat a mile. In short, commercial economy demands that the vessel should proceed at such a rate as to make each mile cost as little as possible. The most conclusive method of arriving at this speed is to try the vessel at all desirable speeds. The expense in time, labor and money is prohibitive against making speed trials when the vessel first comes out, but it is determined approximately and perhaps closely by many by observing the cost of the different speeds the vessel makes in her ordinary trips. There is, however, a method of determining this by calculation, if the proper data is at hand, and we have before us the data obtained from two vessels to illustrate.

Now the power to drive a vessel varies with the cube of the speed and approximately with the cube of revolutions producing that speed, and since the ratio between the speed of ship and the revolutions per minute varies greatly with the weather, we will make the revolutions the basis of our calculations. Whether a vessel proceeds fast or slow it is agreed that a certain quantity of coal is necessary to supply steam for the auxilliary engines and pumps, to maintain temperatures of boilers, pipes and cylinders and to overcome the initial friction of the engine, and this will be (q) pounds per 24 hours. To this must be added the real cost of prorulsion, which at the rate of one revolution per minute = k lbs. and at R revolutions per minute = kR^3 lbs. per 24 hours; then the total coal per day $Q = (q + k R^3)$.

Now having data from which we can find two values of Q corresponding to two rates of revolution, we easily derive, from $k = \left[\frac{Q - Q_1}{R^3 - R_1^3}\right]$ and $q = k R^3$ the values of (k) and (q), and substituting them in the formula $S = \left(\frac{q}{2k}\right)^{\frac{1}{3}}$, proposed by Mr. Lowe, U. S. N., we find a value S which is the most economical rate possible.

In vessel [A].

R=72.7. R=72.4 Rev. per min.
Q=63,194 lbs. Q=42,552 lbs.
k=.146 lbs. q=7,094 lbs.
S=62.4 Rev. per min.

In vessel [B].

R=71. R=67 Rev. per min.
Q=58,272 lbs. Q=54,072 lbs.
k=.073 lbs. q=31,071 lbs.
S=59.7 Rev. per min.

In vessel A the economical rate and the lowest rate observed happen to be the same, and in both cases the economical rate is lower than usual rate of ordinary operation.

It may, however, be desirable to take into considerarion the other constant expenses of maintenance and operation in the determination of this economical rate, and this can be done by substituting for the quantities (q) and (k) their costs in dollars and cents and adding to the value thus found of (q) the cost per day of such other constant expenses as may be desired to take into this determination, and substituting these values in the equasion $S = \left(\frac{q}{2k}\right)^{\frac{1}{3}}$.

Now in vessel [A] the sum of those expenses which do not vary with the speed of the vessel, including interest, taxes and depreciation, will approximate $275 a day, and this sum will raise the economical rate to a point higher than it is practicable to maintain, and it remains for a vessel owner to determine what expenses shall be taken into consideration in this method. Then there is a way of determining the valaes of [q] ank [k] of a vessel from the data of one rate of coal consumption and corresponding revolutions, but more of this next time.

THE JOY VALVE GEAR.

In a conversation with a prominent engineer on the lakes we were asked our opinion concerning the Joy valve gear. A favorable reply elicited an unfavorable one from the engineer, and his reasons were that in the Joy valve gear there were no opportunities for changing the lead without cutting and mutilating somewhere, and also that the constant lead would not permit of high rotative speeds, such as are developed at times on the cruisers of the navy, unless the lead was made large, in which case it would be too much for lower speeds generally used. Regarding the changing of the lead, the gentleman's opinion is a good one, but the opportunities for changing are as good with a Joy valve gear as with the Stephenson link gear in which the go ahead and backing eccentrics are cast together, as is the case on too many of our large engines. Supposing the engines on the cruisers are designed for economy at low speeds and their valves have leads corresponding; now, using the Stephenson link this lead is diminished when the engine cuts off longer, as is necessary for higher speeds than the economical, while with the Joy gear the lead is the same at long or short cut-off, and would be greater at a long cut-off than with the Stephenson gear, supposing both have the same lead at economical speed.

MARINE REVIEW.—A horizontal pump has been working against a boiler pressure of 150 pounds for ten years and doing its work well, but will not work against atmospheric pressure through a hose. Water valves are all right; steam valves are all right. What is the matter with the pump?

Cleveland, O., March 9, 1894. QUERY.

At first sight this question seems analagous to the one "Why is the moon made of green cheese?" or "Why does the Keeley motor mote?",but on further consideration we can conceive that the water valves are all right to a visual inspection, but that due to weak springs or light weight they require the back pressure of 150 pounds to seat, and that the lesser pressure of the atmosphere plus the friction of the water in the hose is not sufficient to close them quickly enough. We would be pleased to hear from engineers on this subject, as to whether they have experienced this difficulty and what examination proved the cause to be.

New Schedule of Wages.

At a meeting of managers of the Lake Carriers' Association in Cleveland, Tuesday, at which Secretary Keep and nearly all of the leading owners of Cleveland were in attendance, the salaries of officers and men in charge of the shipping offices were cut about 20 per cent., and the schedule of wages covering all employes on vessels was reduced materially from last season's opening card. It was decided to close the shipping office at Escanaba and open a new office at South Chicago, the latter to be under the direction of the shipping master at Chicago. Messrs. John Duff and Andrew Hackett of Amherstburg were in attendance, and arrangements were made with them for continuing the range lights in the vicinity of the Lime-Kilns crossing, which are on Canadian soil, and which, with the exception of the Point Edward ranges, are the only private lights now maintained by the vessel owners. No arrangements have as yet been made for maintenance of the Point Edward ranges. The new schedule of wages follows:

SCHEDULE OF WAGES, LAKE CARRIERS' ASSOCIATION, OPENING OF SEASON, 1894.

	PER MONTH.
On Steamers—	
First class boats, chief engineer	$100
First class boats, second engineer	70
Second class boats, chief engineer	$75 to 90
Second class boats, second engineer	60
Third class boats, chief engineer	60 to 75
Third class boats, second engineer	50
First mates	50 to 70
Second mates	35 to 50
Cooks	35 to 50
Helpers	10 to 15
Firemen	25 to 30
Wheelsmen	25 to 30
Lookouts	20 to 30
Deck hands	12 to 15
Oilers	25 to 30
On Consorts and Sail—	
Firts mates	30 to 45
Second mates	25 to 35
Cooks	25 to 30
Seamen	25 to 30
Boys	12 to 15

Firemen fitting out will be paid $1 a day.

Highest Speed Afloat.

The highest speed afloat has once more been exceeded, the British torpedo boat destroyer Hornet at the present time standing ahead of all craft in regard to swiftness of steaming. The Hornet is a sister vessel to the Havock, the first of this new type of war vessel, of which the Brittish government is building about thirty. The Havock, which was illustrated and described in the REVIEW of Feb. 8, attained a mean speed on trial of 26.783 knots, and now the second boat, the Hornet, has made an average of 28.02 knots on six runs. These boats are 180 feet long, 18 feet 6 inches wide and are of the usual torpedo boat construction in general appearance. The Hornet, however, has no less than four funnels to serve her eight boilers, and in this respect differs essentially from her sister-ship.

SOME TIME AGO THE MARINE REVIEW PUBLISHED A SHORT HISTORY OF LAKE NAVIGATION, RUNNING THROUGH FIVE NUMBERS. WE HAVE SEVERAL SETS OF COPIES OF THESE NUMBERS WHICH WE WILL FURNISH AT 50 CENTS. ONE OF THE NUMBERS CONTAINS INFORMATION OF LOCKS OF THE ST. LAWRENCE AND ERIE CANALS, WHICH IS WORTH THE PRICE ASKED FOR ALL OF THE NUMBERS.

Launch of the Harvey H. Brown.

Special Correspondence to the MARINE REVIEW.

DETROIT, Mich., March 15.—The launch of the Harvey H. Brown was attended with the usual success of everything undertaken by the Detroit Dry Dock Company. No special invitations were extended but a general invitation was given to the friends of the company to secure complimentary tiskets for a special train over the Michigan Central to Wyandotte and return. The friends proved so numerous that a second train of seven coaches was chartered,so that between 800 and 1,000 persons were given an excursion and the pleasure of seeing a first class launch. Among these were a number of the employes, and laborers that are not usually included in such festivities. Notwithstanding she is a straight-back, the Brown showed a pretty hull, the bow looking "quite English you-know" with stockless anchors drawn up to the hawse-pipes. This boat is something more than a staight-back. We have monitors and whalebacks and turtlebacks, but this boat has a turtle-back on her belly. I refer to the oak sheathing on her bottom, extending to the turn of the bilges and within 15 or 20 feet of the bow and stern, and about 5 inches thick. Along the sides it is protected by an angle iron and at the ends by a shoe. The sheathing is bolted on with 1¼-inch bolts, having heads counter-sunk with cotton under them and the hole plugged with wood. Inside the shell plate a washer with cotton under it is used under the nut. It is safe to say the Brown will not lose any of this sheathing unless it is generally known. Of course she went into the water nearly even. If all ordinary means fail, the plan adopted in launching boats here provides a reserve effort at every point.

The gentleman for whom the boat was named was not present, and neither was Capt. E. M. Peck, but he was represented by E. T. Peck, who is said to be principal owner. Among other prominent marine men in the launching party were Capt. James Millen, L. C. Waldo, Charles Norton, James Findlater, Neil McMillan, Joseph Mayworm, H. D. McMillan, Kenneth Anderson and many more. The party was in charge of Gilbert N. McMillan of the company, and included Mr. C.B. Calder, the new superintending engineer. The boat is 362 feet over all, 342 feet keel, 42 feet beam and 25 feet depth. Her engines, triple expansion, are 22, 35 and 56 inches by 44 inches stroke.

While everything as to hull, size of engines and boilers is the same as in the Selwyn Eddy, there will be a notable departure in the feature of introducing the Howden system of forced draft in connection with the boilers. This will give an opportunity for comparison between two boats practically duplicates. It will demonstrate to lake vessel owners that this system saves coal, gives more steam and therefore more power, and permits of the use of lower grade coal than natural draft.

Ore Covered by Contract.

Aside from the vessels of Pickands, Mather & Co. and other iron ore concerns, capacity to the amount of about 1,100,000 tons has been engaged up to this time on contract business from the head of Lake Superior at 80 cents. Added to this there is 150,000 tons of Escanaba ore, which was taken some time ago by the Inter-Ocean Transportation Company of Milwaukee at 60 cents, and 150,000 tons of Marquette ore, covered within the past week by J. H. Outhwaite & Co. at 80 cents for the season. This latter block will be carried by Curtis & Brainard's boats Cherokee and Chippewa and by the steamer Ketchum towing Capt James Davidaon's schooner Aberdeen and the schooner Becker. These figures are based on very careful estimates, and if it was thought advisable the names of all boats under contract could be published. The estimate includes the whalebacks, but none of the boats of the ore companies. If the latter were included, the amount covered from all ports would be considerably over 2,000,000 tons.

The McElroy Flyer.

The Frontier Iron Works of Detroit has undertaken an important job in the construction of quadruple expansion engines for the new boat being built by the McElroys of St. Clair for service on the rivers, and the result of their efforts will be looked to with a great deal of interest, especially among the leading engine constructors on the lakes. As an indication of the very fine lines of the hull, it may be noted that the stern pipe is 38 feet 8 inches long. This pipe is a steel tube in three sections connected by brass thimbles, and is arranged so as to permit of the forward and after sections being readily withdrawn, in order to refit or renew the two bearings which the tube contains, and which are rendered necessary by the great length of the shaft. Besides these, there is the usual stern bearing and another just forward of the stuffing-box. The outboard shaft is 7⅞ inches diameter and 43 feet 9 inches long. Its great length is best shown by comparison. The outboard shaft of the Merida, the longest steamer on fresh water, is 18 feet 2 inches long. The engine bedplate is a composite structure of steel I beams and cast steel cross webs carrying the shaft journals. The I beams are 12 inches deep, weighing 56½ pounds per lineal foot. The guide columns are cast steel with cast iron guide faces bolted on. The front columns are wrought iron, two under each cylinder.

The cranks are of steel with counterbalances cast on. The crank pins are 7¼ inches by 7 inches and have a 3½-inch hole through them. The weight of moving parts is reduced to the minimum consistent with strength,but all wearing parts have extraordinarily large wearing surfaces. The six main journals and four crank pin boxes are all lined with the best white metal. The thrust bearing has eight collars, also faced with white metal. The valve gear, as we have before stated, is of the Joy pattern on the first three cylinders; the low-pressure valve is driven by a single idle eccentric. All pistons are of steel, coniform, and each is fitted with a single ring of the type which the Frontier Iron Works introduced with such great success in piston valves, and which are now to be given more extended application. The three piston valves are 8 inches, 12 inches and 16 inches diameter, respectively, and the latter is double ported. Metallic packing is to be fitted all around. The condenser is a Dean (Indianapolis) No. 7.

Another Big Freight Steamer.

Another big steel freight steamer will be added to the Minch fleet of Cleveland before the close of the coming season of navigation. A contract has been let with the Cleveland Ship Building Company for a boat similar to the steamer Alva, built by the same company last winter for M. A Bradley and others. The fact that a boat like the Alva can now be built for probably $50,000 less than the price at which that boat and others of her class were built a year ago has had much to do with this contract. Then, too, the officers of the ship building company are interested in other steamers of the Minch fleet, and will, it is understood, be part owners of this boat. Gangways and hoisting engines for handling package freight will be placed in the new boat and she will have nine hatches. The principal dimensions will be 324 feet keel, 42 feet beam and 26 feet 3 inches moulded depth. The engines, triple expansion, will have cylinders 20, 33 and 54 inches by 40 inches stroke. Boilers will be of the Scotch type, 12 feet 4 inches diameter and 13 feet long, the steam pressure to be 160 pounds to the square inch. The construction will be in accordance with rules of the Bureau Veritas.

In General.

Capt. Robert Johnson, sixty-two years of age, died at Hamilton, Ont., Tuesday.

Capt. Thomas D. Gibson and Engineer Lee Corns will again be in charge of the Toledo steamer Panther. Capt. Charles Goodsite will command the schooner Massassoit.

An increase of about 10,000 tons a week in the make of pig iron was noted on the first of the month, and a few large furnaces in the Ohio and Pittsburg districts have since gone into blast, but the change is not greatly for the better.

One of the electric launches used on the lagoons of the World's Columbian Exposition was shipped to Venice in September last and was recently placed in service on the canals of that city. More of the yachts will be built, it is said, to take the place of the gondolas.

In 1892 Mr. Cramp, testifying before a government commission which was dealing with the question of using steel plates for ship building, stated that he was paying 3.25 cents per pound for iron ship plate. He noted that he was then giving 7¾ cents for the best boiler plate. Such figures seem strange at this time.

Belleville boilers to be fitted into two new British cruisers will be forty-eight in number, and will weigh 500 tons less than the ordinary Scotch boilers and give the same power. The total weight is put down at 950 tons, and the power to be developed 25,000 indicated horse power, thus giving about 26 indicated horse power per ton of boiler.

Some of the New York papers have given up considerable space to another of Edison's schemes in the shipping line. He is now at work with a plan to grease the sides of ships so that they will slip through the water more readily. He says the friction of salt water and its constituents is much more than is generally believed and if he can only do what he is trying to do the Campania can make the voyage between New York and Liverpool in four days.

A boom in bilge keels seems to have set in in naval construction affairs since the rolling propensities of the Resolution were demonstrated. The keel of the Terrible is now laid in the yard of Messrs. J. & G. Thompson, Clydebank, and it has been determined that both in her case and in that of the companion ship Powerful, being laid down at Barrow, deep bilge keels are to form a feature of their hulls below water. It has also been decided to fit deep bilge keels to the battle ships Majestic and Magnificent, building at Portsmouth and Chatham respectively, as the width of at least two docks at Portsmouth is sufficient at the entrance to admit ships of the Royal Sovereign class, even when fitted with bilge keels of considerable spread.—Fairplay, London.

AN ALPHABETICAL LIST OF 1,200 VESSELS—THE BUSINESS FLEET OF THE LAKES—WITH THE PORTS AT WHICH THEY WERE TIED UP FOR THE WINTER, WAS PUBLISHEED AS A SUPPLEMENT TO THE REVIEW AFTER THE CLOSE OF NAVIGATION LAST FALL. THIS LIST MAY PROVE SERVICEABLE TO BROKERS, SHIP CHANDLERS AND OTHERS IN PREPARING FOR THE OPENING OF ANOTHER SEASON. FOR 10 CENTS IN STAMPS WE WILL FORWARD A COPY OF THIS LIST TO ANY ADDRESS.

Water Tube Boilers.*

WITH PARTICULAR REFERENCE TO EXPERIENCE WITH GENERATORS OF THE BELLEVILLE TYPE.

I have been requested by a number of engineers to read a paper on this subject, giving my experience with the particular system known as the Belleville. As I am unaccustomed to either read or speak in public, I shall give in plain words my experience with these boilers during the past six and one-half years, on the yachts Shearwater and Wild Duck; also my observations of the Coryell, a 54-foot launch, with a 40 horse power boiler, owned by Mr. Forbes. I shall begin with the statement that I am not interested financially in these boilers, so that what I have to say about them is from no interested motive,but a desire to show engineers what I have found to exist—a perfectly safe, economical and easily handled boiler—and also the satisfaction an engineer can have in running one of them.

In these days of triple and quadruple engines and high steam, the Scotch boiler has lost its popularity, on account of the very heavy material it must be made of to carry steam of over 150 pounds; then its great weight and the space it occupies is detrimental to any trade or service. Owners of steamers have been looking for a water tube boiler, at once safe and durable, one that an engineer can repair at sea without disturbing bulkheads, coal bunkers, etc., and arranged so as to be accessible from the fire room; also made in sectional parts, interchangeable, and easily removed and replaced.

AUTOMATIC FEEDER, AND SEPARATOR-PURIFIER.

My experience convinces me that all boilers holding but little water should be fitted with a perfect automatic feeder. I consider this very essential and important. I have learnd to trust the little instrument I have used so many years, which, if given reasonable care, I find keeps itself very sensitive to the water level, and to control the feeding perfectly. No automatic feeder must be used unless it is absolutely reliable. It must not require constant watching, yet, it must never fail to give instant notice of any obstruction that interferes with its working. This precaution Mr. Belleville has given to his feeder. I can tell at a glance by the water in the glass guage, whether all its parts are working properly, and the work of adjusting it is simple and can be quickly done.

The feed water goes first into the separator-purifier through a spray pipe at one end of the separator, and crosses it to the return pipe. During this crossing, owing to the sudden rise of heat, lime and other impurities are separated from the feed water, and being heavier than the water, are deposited in the sediment chamber to be blown off at intervals. The steam made in the tube elements, enters the bottom of the separator-purifier and must pass through a special mechanism which separates the water that might be in the steam, before it can reach the discharge cone. This is the reason why a Belleville boiler, if held up to its pressure, always gives dry steam. You will notice that the name "separator-purifier" is a good one to use, instead of steam drum.

Having separated the water from the steam, and also the impurities from the feed water, it is easy, by following the course of the water circulation, to see that it is impossible for either the steam to mix with that water again, or for the feed water to re-absorb its impurities, and these operations are kept up as long as there is any furnace heat. As this water circulation is important, I will repeat what I have just said, briefly thus: The feed water enters the separator and crosses over to the return pipe, losing in the passage its impurities, and dropping them in the sediment chamber; being heavier than the water, they settle at the bottom, to be blown off, but the water that enters the collector tube, and which fills the elements, is taken from the top of the sediment chamber purified, so that no impure water enters the elements at any time. Nothing like a deposit can remain in the tubes of this boiler, because they are swept clean by the circulating current, and as the sediment chamber is the only quiet water in the boiler, all the heavy impurities deposit there, and only pure water gets into the tubes, so that when circumstances have forced me to feed sea water for days together, I have made no scale in my boilers, because the lime was taken from the sea water as I have described.

THE FEED PUMP.

A good feed pump is necessary, an independent non-stopable pump at that. It must never cease to work and with the Belleville boiler system it never stops after 50 pounds steam is raised, until the fires are out. The pump which Mr. Belleville makes, is perfectly under the control of the automatic feeder. I may say that I can by listening to its strokes, tell the condition of the fires and know whether the firemen are giving proper attention to them or not; also as the engine speeds up or slows, so will the strokes of the pump vary.

In taking charge of my first Belleville boiler, I heard many discouraging remarks about its working. I found I had to deal with a new system, requiring a different management from the ordinary boiler. I set myself about the task of learning the whys and wherefores. I learned that there had been such careful thought given to every detail that I had but to work according to instructions, to obtain the best results. I can truthfully say that an engineer can be more easy-minded in the discharge of his duties using one of these boilers than he can with any other boiler of which I have any knowledge. The work can be kept well up with less fatigue to the firemen or engineer than on any other boiler. One instance was that on a southern voyage among the West India islands. I was able to get along without damage to my boilers and without troubling myself to obtain fresh water, when it was difficult to procure, while the owner had a most pleasant voyage, as his boat was not in port unless he so desired it. I opened by boilers afterward and found no scale and not the least necessity for repair. Contrast this with what any other boiler can do under like circumstances.

BELLEVILLE REGULATING PRESSURE VALVE.

A part of this system is a regulating pressure valve. I like it very much and find it useful. My boilers on the Wild Duck are allowed 300 pounds steam. I set my valve to give the engine 200 pounds steady, but the boilors may vary from 200 to 300 pounds without disturbing the working of the engines, and I never need use the the safety valve.

CONTROL OF THE STEAM PRESSURE.

Another thing connected with the control of the steam pressure is very satisfactory to engineers. By using the ash-pit dampers and tube box doors, I can keep the steam within the limit of 15 pounds in excess; thus with my best fires, engine changed suddenly from full speed to a dead stop, the steam need not rise over 15 pounds higher in the next half minute to become stationary, and then lower in the next three minutes. I can raise steam to 200 pounds from banked fires in eight minutes, from cold water in twenty minutes, and I have no hesitation in saying that I have a certain control over the steam making power to prevent over-pressure. The brick furnaces in these boilers have given me no trouble whatever. Their repairs, covering a period of several years, have been almost nothing; I have pointed up some joints only in this time. The packings Belleville furnishes for his glands on any of the working pistons are of a special kind, and almost frictionless, while being very durable; it is an advantage to have lasting packings.

I am not alone among American engineers in my admiration of Belleville boilers. Mr. Brown, engineer of Sultana, attempted to cross the Atlantic with a something called a boiler, but which became scrap iron and was thrown overboard on the passage—an event which I believe he prepared for in advance. I had the pleasure of showing him the boiler on the Shearwater,which he declared to be perfect. This led to his getting two for his boat, after which he steamed in European waters for a year. His experience is the same as mine has been. He says the boilers are perfection, and this is from an engineer of long experience on ocean steamers. I remember well of his prejudices and the complete change wrought in his mind by a few hours' sail on the Shearwater.

Among recent applications, showing that these boilers are becoming popular with both merchant and navy designers, are the two high speed passenger boats of 7,000 horse power each, now building at Cleveland, O., and three vessels of the English navy, one the Sharpshooter of 4,000, and the Powerful and Terrible of 25,000 horse power each. Belleville boilers are now going into the first of these three boats and for the latter two they have just been begun. This acceptance for the English navy is a surprise, as we have always been told that their engineers did not favor the boilers, but the large power application demands it and disposes of many of the unfair criticisms so freely circulated by our own navy. In conclusion I commend the Belleville boilers to all engineers who want economy and safety, as a boiler easy to clean at the heating surface both inside and outside and also at all the draught passages. An engineer can always bring these boilers into port in a condition te leave again without delay; there is not the nuisance and work of the Scotch boilers when just in from a voyage, such as tube sweeping, clearing the ashes from the draught passages, etc. I find it easy to keep fairly clean decks at sea and especially in port. I avoid much work which ordinarily fouls the boat near the boilers, and better still, the firemen have more leisure time in port.

*A paper read before the New York association of marine engineers by J. A. Courier, engineer of the yacht Wild Duck.

Kingston News Notes.

Special correspondence to the MARINE REVIEW.

Mr. C. F. Gildersleeve has been appointed manager of the Richelieu and Ontario Navigation Company and at once assumed office. He will remove from Kingston to Montreal. He is of a family of steamboat owners. His father built the first steamer that plowed Canadian inland waters. He built the Frontenac at Bath in 1818. Last week there was almost an amalgamation of the Richelieu company and the Thousand Island Steamboat Company. The bargain was completed but when the lawyers got to work it was found that disabilities had arisen. A new charter would be needed before the American company could be taken over and a monopoly of river traffic from Toronto to Montreal obtained, and the arrangements fell through. Remedial legislation will be secured and mayhap next season will find the amalgamation effected.

A new steamer 64 feet over all and 9 feet beam is being built at Belleville for ferry purposes. A steambarge is being built at Garden Island and will be used for towing purposes on the River St. Lawrence.

Subscribers will avoid danger of mistakes by giving the old as well as the new address when a change is desired.

Illustrated Patent Record.

SELECTED ABSTRACTS OF SPECIFICATIONS OF A MARINE NATURE—FROM LATEST PATENT OFFICE REPORTS.

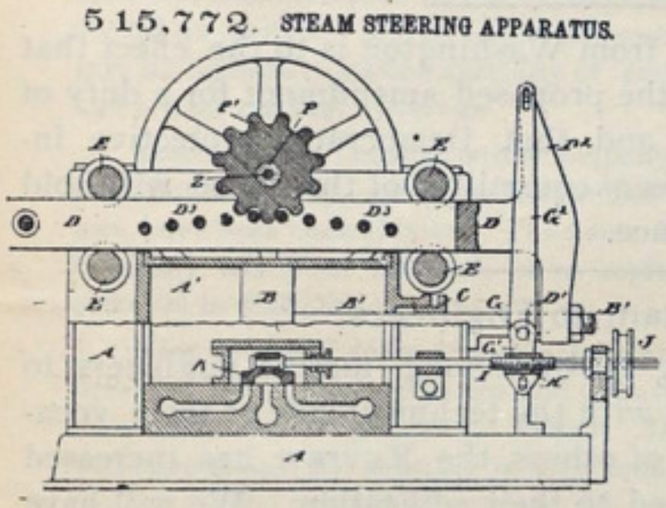
515,772. STEAM STEERING APPARATUS. Cyrus H. Hawkins, Brooklyn, N. Y. Filed July 13, 1893. Serial No. 480,329. (No model.)

In a steam steering apparatus, the eccentric gear wheel P′ and correspondingly arranged engaging means, as the pins D3 set in a curved series carried on the slide D, in combination with the valve K controlling the action on the piston B of steam or other fluid under pressure, the screw-threaded rod I controlling such valve, means, as the pulley J and connections operated at will by the helmsman, for revolving such rod, the nut H engaging such screw threads, and means, as the arms G′, G2 , turned by the movement of the piston for restoring the valve to its neutral position when the piston has moved sufficiently, all arranged for joint operation.

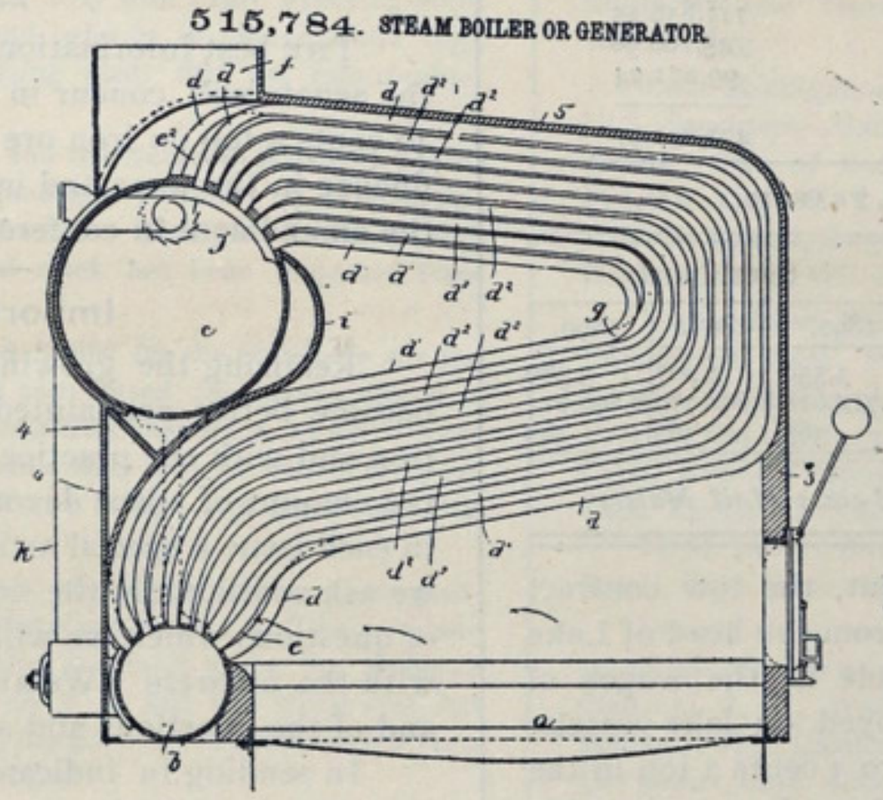
515,784. STEAM BOILER OR GENERATOR. Charles D. Mosher, New York, N. Y. Filed Jan. 7, 1893. Serial No. 457,604. (No model.)

Claim.—In a boiler or steam generator, the combination of a furnace or fire box, a water drum extending across the rear end of the fire box, a steam drum extending across the rear end of the fire box directly over the water drum, vertical return pipes connecting said drums, and a group of tubes connecting the upper portion of the water drum with the upper portion of the steam drum and bent to form loops disposed in vertical planes and extending lengthwise of the fire box, the tubes being bent to form inclined lower portions extending from the water drum toward the front of the fire box, and substantially horizontal or slightly inclined upper portions extending toward and joining the steam drum, the tubes forming one side of the group being arranged to form a wall having openings *e* at its lower end and openings e^2 at its upper end for the passage of the products of combustion, said wall extending continuously from the openings *e* to the front of the fire box and from thence back to a point over the steam drum where the openings e^2 occur, while the tubes forming the opposite side of the group are arranged for a portion of their length to form a wall extending from the water drum toward the front of the fire box and are open or separated from each other along the portions extending from the front of the fire box toward the steam drum to permit the escape of soot and ashes from between the tubes comprising the upper portions of the loops into the space between the parts or members of the loops, whereby cleaning is facilitated, as set forth.

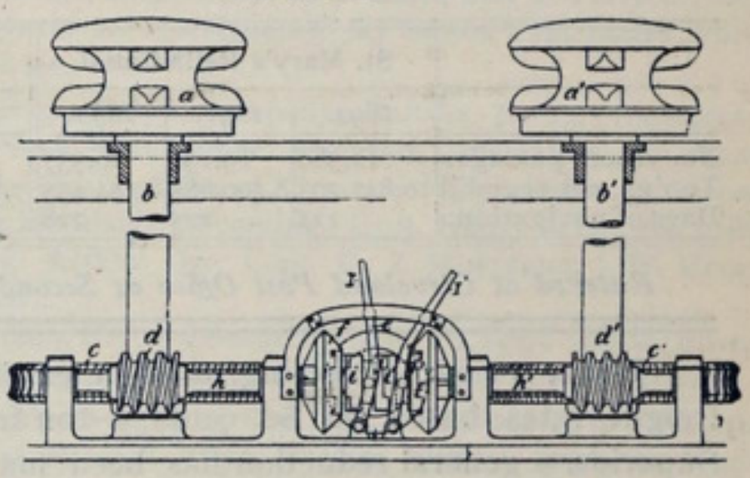
515,772. STEAM STEERING APPARATUS.



515,784. STEAM BOILER OR GENERATOR.



515,935. CAPSTAN



515,878. DEVICE FOR FLOATING VESSELS OVER BARS.

515,878. DEVICE FOR FLOATING VESSELS OVER BARS. James Hadley and Festus Foster, Haven, Kans. Filed April 15, 1893. Serial No. 470,416. (No model.)

Claim.—A device for floating vessels, &c., comprising a series of collapsible or inflatable bags, a heavy cord or rope netting surrounding or enclosing each of said bags, rings held in said netting, flexible connections attached to said rings and connecting said bags in pairs, and said pairs in series, air pipes connecting said bags in series, and means on the bags at one end of the series for connection with an air supply.

515,935. CAPSTAN. William H. Harfield, London, England. Filed Nov. 13, 1893. Serial No. 490,822. (No model.) Patented in England Jan. 29, 1885, No. 1,298.

Claim.—The combination with the driving shaft provided with a driving gear, of a pair of independent capstan operating shafts, each provided with a loose gear in engagement with the driving gear, independent clutches for connecting said loose gears with their respective shafts, each of said clutches being constructed to engage parts connected with the other shaft, and means for throwing each of said clutches out of engagement with its loose gear and into engagement with the other shaft.

CORRECTED CHARTS OF THE ST. MARY'S RIVER CAN BE HAD FROM THE MARINE REVIEW, 516 PERRY-PAYNE BUILDING, CLEVELAND, O.

Another Waif of the Waves.

Editor MARINE REVIEW.—We received the MARINE REVIEW today, and in looking it over found the article "A Waif of the Waves," which attracted my attention to a considerable extent, and thinking it may be of some value, I write you regarding a similar story that may be the means of bringing together a brother and sister. In February, 1887, I went to Michigan to visit relatives. While there I had an introduction to a handsome girl of low statue, light hair and blue eyes. My husband, who sails the steamer Florida, having followed the lakes for a number of years, I was in need of someone to stay with me, and as the girl proposed to do so, I took her home with me. After we were at home together, she related to me her history, as best she could, from what she had learned from her foster mother. She said her mother died when she was born and her father was captain of a steamboat. He kept a nurse to take care of her and her little brother. The nurse and the two children were taken by the father on a lake trip. Her brother was two years old, she learned, and herself only a few months old. She learned further that her father and nearly all others aboard the boat were lost on the trip; that a man on the ill-fated boat cried out to a party of rescuers on another boat that was within speaking distance to catch and save a baby which he threw into the water. The baby was the girl to whom I refer. From the force of the waves or the effect of striking the water, the child received permanent spinal injury. The girl says that her brother was saved and taken to a home for the friendless in Toledo or Detroit. She was adopted by a German family and the brother was also given to the care of strangers. The girl lived with me in the summer of 1886 and was married the following winter. She, like the waif you mention, does not know the name of her parents, but someone has told her it was Dorchester. I visited her in Conneaut, O., since she was married. She has tried in many ways to find her brother but without avail. The story in the REVIEW comes the nearest to anything I have heard that might have a bearing on her relationship, and if there is anything more definite wanted in regard to her I will do all in my power to learn it. Should the two prove to be brother and sister it would be a rejoicing. I pray it may be. I will try to ascertain the name of her foster parents, her address and the name of the home she was placed in, if it is required.

North Kingsville, O. MRS. HENRY MCADAMS.

The foregoing commuication is printed on account of the interest that attaches to the story which it relates. The girl referred to is not, however, related to Franc Willette of Milwaukee, whose strange history was referred to in the REVIEW of last week. As a result of this newspaper article, which was originally printed in the Milwaukee Evening Wisconsin, Franc Willette, or Frank Willis as he is now called, last week learned of his relatives in Nebraska and Fon du Lac, Wis., after being in ignorance of his name, birth-place and parentage for thirty-seven years, since he was rescued, a babe, from the burning steamer Niagara on Lake Michigan.

Alpena Lumber Business.

About 40,000,000 feet of logs will be received at Alpena from Canada the ensuing summer. There is in Thunder bay waters about 75,000,000 feet of old logs and nearly as many new ones have been put in this winter, which will give the mills a full stock. Alpena manufacturers are carrying over about 50,000,000 feet of lumber and trade has been very dull with them during the winter, but there is some inquiry now, and they are disposed to the idea that the stuff will be wanted later on. The cedar business has been carried on more extensively this winter than ever before on the Huron shore. A large quantity of cedar railway ties have been gotten out, besides poles and posts.

MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 516 Perry-Payne building, Cleveland, O.
Chicago office, (branch), No. 726 Phoenix building.

SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department contain the names of 3,761 vessels, of 1,261,067.22 gross tons register in the lake trade. The lakes have more steam vessels of 1,000 to 2,500 tons than the combined ownership of this class of vessels in all other sections of the country. The number of steam vessels of 1,000 to 2,500 tons on the lakes on June 30, 1893, was 318 and their aggregate gross tonnage 525,778.57; in all other parts of the country the number of this class of vessels was, on the same date, 211 and their gross tonnage 314,016.65. The classification of the entire lake fleet on June 30, 1893, was as follows:

Class.	Number.	Gross. Tonnage.
Steam vessels	1,731	828,702.29
Sailing vessels	1,205	317,789.37
Canal boats	743	76,843.57
Barges	82	37,731.99
Total	3,761	1,261,067.22

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Net Tonnage.
1889	225	107,080.30
1890	218	108,515.00
1891	204	111,856.45
1892	169	45,168.98
1893	175	99,271.24
Total	991	471,891.97

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

	St. Mary's Falls Canal.			Suez Canal.		
	1892.	1891.	1890.	1892.	1891.	1890.
No. vessel passages	12,580	10,191	10,557	3,559	4,207	3,389
Ton'ge, net regist'd	10,647,203	8,400,685	8,454,435	7,712,028	8,698,777	6,890,014
Days of navigation..	223	225	228	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

WITH a view to meeting, to some extent, the low contract freight rates based on 80 cents a ton from the head of Lake Superior, a general reduction has been made in the wages of captains, engineers and all hands employed on lake vessels. This cut in wages will probably amount to 3 cents a ton in the cost of carrying iron ore. Added to this, there is a reasonable assurance of a uniform charge of 3 cents a ton for trimming ore in the vessels at upper lake ports, which means practically a reduction of 1 cent from last year's charges. The announcement of a cut in the wages of iron ore shovelers and men employed on the ore docks at Lake Erie ports is taken to mean that the charge to the vessel for unloading ore is to be about 2 cents less than it was last season, so that in all the cost of carrying ore is to be reduced, through the items here named, about 6 cents a ton. Prices of coal (fuel) may add a trifle to this lessening of carrying charges, but, after all, there is little consolation in it for the vessel owner, in view of the freight outlook, and the worst feature of the whole matter is the effect that these reductions will have upon labor. Buffalo vessel owners held a meeting a few days ago to consider means of securing a reduction in the shoveling charges on grain. They accomplished nothing, but have not given up the subject.

THROUGH certain influences brought to bear upon the board of supervising inspectors of steam vessels in Washington at their last annual meeting, one of the rules of the service was changed so that all machinists, as well as locomotive and stationary engineers, must serve one year in the engine room of a steam vessel before they are entitled to examination for a license as engineer. This ruling is in part fair enough. The machinist who has worked three years after serving an apprenticeship in a marine engine works should still have some experience aboard ship before he is given charge of the engines, but the board certainly blundered in not giving such a man some advantage over the stationary or locomotive engineer, or the machinist who has never seen a marine engine.

MR. CHAMBERLAIN, the new commissioner of navigation, wants the government to continue the policy of encouragement to American shipping inaugurated in the act Americanizing the steamers Paris and New York, by offering the same inducements to other owners of foreign-built ships, who are willing to construct in this country an equivalent of the tonnage admitted to American register. He is the author of an article on the subject in a recent number of the North American Review. A bill with this end in view, introduced by Representative Tracey of New York, is being considered by the house committee on merchant marine and fisheries.

FROM papers filed by the Merritts in a legal action begun at Duluth against the Rockefeller-Missabe syndicate, as well as from statements made recently regarding the affairs of the American Steel Barge Company, it would seem that as a creditor of the barge company Mr. Rockefeller has about as strong a hold on it as he had on the Missabe mines when he gathered in the entire holdings of the mining syndicate.

THE best information from Washington is to the effect that the senate will concur in the proposed amendment for a duty of 40 cents a ton on iron ore and that Democratic protective influence in the ways and means committee of the house will hold the amendment in conference.

Important to Engineers.

Realizing the growing desire among marine engineers to become better acquainted with the technical side of their vocation and with the practice of others, the REVIEW has increased the amount of space devoted to their edification. We will have in each issue a special article on some subject of this nature, and we ask additionally the co-operation of the engineers in the way of questions which we will endeavor to answer and then publish with the answers. We also invite free discussion of the articles and of the questions and answers.

In sending in indicator cards or other data for investigation make the same full and complete. With indicator cards, for instance, besides the revolutions, pressure and number of springs, send as far as possible dimensions of valves, sequence of rotation of cranks, clearance and receiver spaces. Correspondents will sign their own name and give name of boat concerned to get answer, but these will not be published if it is so desired. The questions should be such that the answers will be of general interest.

Mr. Geo. C. Shepard, who has made numerous tests of marine engines and boilers, and who has had experience in designing and constructing same, will be associated with us in this department.

Some Coast Ship Yard Orders.

Three important orders are reported from coast yards. Neafie & Levy of Philadelphia have contracted to build another vessel, a twin-screw steel steamer 242 feet long and fitted with triple expansion engines, for M. Menendez & Co. of Cuba. The same firm will build for Capt. Lewis a steel screw passenger and freight steamer for service between Baltimore and Washington. The dimensions are 180 feet length, 40 feet beam and 11½ feet hold. The engine will be compound with cylinders of 20 and 40 inches diameter and a stroke of 24 inches. W. E. Woodall & Co. of Baltimore will build for Baltimore parties a small freight propeller—123 feet long, 23½ feet beam and 8 feet depth. The engines for this boat will be of the steeple compound type with cylinders 12 and 24 inches diameter and a piston stroke of 20 inches.

Around the Lakes.

Secretary Keep of the Lake Carriers' Association will spend about two months of the summer in Europe.

Managers of all but one of the Buffalo package freight lines have agreed to send out the first vessels on April 16.

General agents of the insurance companies doing business on the lakes will meet at Detroit in a few days to fix up a hull tariff.

The steamers Fred. Pabst and William H. Wolf, now at Chicago with cargoes of corn aboard, are reported to have been chartered at Buffalo for coal for the return trip to Milwaukee at 40 cents.

Marine engineers of Cleveland paid respects in a fitting manner to the memory of Henry Shupe, whose funeral they attended Tuesday. Mr. Shupe was chief engineer of the steamer Griffin last season.

On account of the unfavorable conditions in the market for wheat, there has been no demand for tonnage at Duluth since the Americrn Steel Barge Company several weeks ago placed capacity for about half a million bushels at 2½ cents.

The Independent Fuel company of Chicago has purchased an old schooner on which to load fuel and will, during the coming season, put coal aboard steamers while they are engaged in loading or unloading. Chicago is better late than never in adopting this system of fueling.

A very neat directory of members of M. E. B. A. No. 2 of Cleveland has just been issued. The book is small but the selection of reading matter which it contains gives evidence of careful preparation. An excellent half-tone likeness of president R. L. Peck adorns the title page. Credit is due Silas Hunter for the entire work.

The tug Swain of the Grummond Line is now at Detroit ready for business, and the Champion will be at Mackinaw City with a full wrecking outfit aboard on April 1. Mr. U. Grant Grummond, who is in charge of the tugs, says he intends to make a specialty of assisting boats that get into trouble, and render the best of service.

The Seymour Transportation Company and the Northern Michigan Transportation Company, operating freight and passenger steamers on Lake Michigan, have been consolidated. The name Northern Michigan Transportation Company has been retained. The capital stock has been increased from $100,000 to $250,000.

Nine thousand dollars for the Italia and $8,000 for the Caledonia are the figures at which these boats are said to have been leased for the new season to carry grain from Washburn to Buffalo. Deducting insurance, which owners will have to pay, the contract is not a profitable one, but of course the poor outlook for the season had much to do with the deal. The Italia is a big carrier.

One of the latest reports regarding the first trip of the Northern Line passenger steamer Northwest includes Grover Cleveland and some of the members of his cabinet among distinguished people who are liable to be the guests of President John Gordon. Capt. Campau, who is to sail the Northwest, has made several trips on Atlantic liners during the past few months, with a view to studying the requirements of his new position.

Homer J. Carr of Chicago, manager of the Lake Marine News Association which collects and distributes marine news and reports of vessel movements during the season of navigation, says of the plans of the association for next season: "The association is getting ready for a good business next season. We have taken in the official custom house reports, which will be a big gain to us. We are going to spread out on yachting to take in all the summer resorts around Chicago and we will also cover all aquatic sports in this territory. The staff in the Chicago office will be increased in accornance with these plans.

Just what shape the tug business will be in at Toledo during the coming season is not yet known. Sullivan & Hubbard having dissolved partnership, Capt. Hubbard retains the old offices and L. S. Sullivan has leased new offices on the same floor. Capt. Sullivan has control of the tugs S. C. Schenck, Roy, Birckhead, F. S. Butler, Uncle Sam and Wm. E. Rooney, and will operate them under the name of the Toledo Harbor Tug Line. Capt. Hubbard will handle the Andrews and Green, but just who will handle the J. S. Spinney and Fannie L. Baker has not yet been decided. There is talk of a pool being formed to include all the tugs, but this is hardly probable.

E. G. Ashley of Toledo and Capt. Alex. Clifford of Detroit have sold the barge Brooklyn to Margurete Lecklider of Teledo for $1,700, cash. The schooner May E. Perew has been sold by the Marinette Barge Line of Chicago to Capts. James and Thomas Taylor of Marine City, for $3,500, and the barge Peshtigo, formerly the consort of the steamer A. D. Hayward, has been sold by W. J. Calhoun to Bay City parties. Other transfers are: Steamer Business, H. J. Johnson of Cleveland to J. T. Mathews of Detroit; steamer Sultana, sheriff's sale at Detroit, $2,750; steamer Hilton, Capt. Thos. Richardson of Milwaukee to Capt. Charles Ellis and Fred Lorenz, same place, $8,000; schooner Morning Star, half interest, Walter S. Johnson of Milwaukee to Fred Lorenz of same place, $3,000; steamer J. E. Rumbell, St. Joseph parties to E. B. Graham of Fish Creek, Wis.

The Hugh MacMillan of Glasgow—Chicago Notes.

Special Correspondence to the MARINE REVIEW.

CHICAGO, Ill., March 15.—The gilded schooner which adorned the spire of the board of trade tower for many years, was taken down Sunday and placed in the exchange room. Tuesday morning the vesselmen had the name of Hugh MacMillan of Glasgow placed on the bow and stern. A bottle ready for the christening was secreted near by. All the morning the vesselmen waited for Mr. MacMillan's appearance on the floor, but he was unfortunately detained until after the board of trade authorities heard of what was going on and sent their hirelings to remove the names and the gaudy decorations on the boat. The boat will be known as the MacMillan, however, from now until the end of time among the vesselmen on the floor. It was removed from the tower because that ornament to the building is being taken down.

Unless the railroad war between Chicago and the seaboard comes to a speedy end, the lake and rail lines will be in a bad way. The railroads are now taking freight at 15 cents per hundred, fifth class. If the steamboat lines take their usual differential of 5 cents, their rate to New York will be 10 cents, and this is not much better than grain at 1 cent per bushel. All hope is now centred in the New York meeting, Thursday, when it is expected the railroad war will be terminated.

Work on the new steel steamer at the ship yard of the Chicago Ship Building Company is progressing favorably, a large force of men now being engaged on the boat.

Some Appointments of Masters and Engineers.

Northern Steamship Company, Buffalo, N. Y.:—Steamers—Northern Wave, Capt. N. Niland; Northern Queen, Capt. E. M. Smith; North Wind, Capt. Delos Waite; Northern Light, Capt. M. J. Haberer; North Star, Capt. William Thorne. No appointment has as yet been made for the North King.

Lake Michigan and Lake Superior Transportation Company, Chicago, Ill.:—Steamers—Manitou, Capt. Allen McIntyre, Engineer S. W. Armstrong; City of Duluth, Capt. Donald McLean, Engineer Henry Chalk; Peerless, Capt. H. C. Page, Engineer J. R. Bennett; City of Traverse, Capt. J. M. Twitchell, Engineer D. MacManemy; Jay Gould, Capt. James White, Engineer A. P. Williams.

Lackawanna Transportation Company, Buffalo, N. Y.:—Steamers—Lacawanna, Capt. Frank Weinheimer; Scranton, Capt. James H. Greene; Russia, Capt. Henry Murphy; Grand Traverse, Capt. John D. Greene; Florida, Capt. Henry McAdams; Wyoming, Capt. Henry Ferguson; Cuba, Capt. Robert Young; Arthur Orr, Capt. C. Z. Montague; J. W. Moore, Capt. Richard Neville.

M. M. Drake, Buffalo, N.Y.:—Steamers—America, Capt. James Gibson; Brazil, Capt. James Hulligan; Thomas Maytham, Capt. Albert B. Drake.

Officers of the vessels managed by Capt. W. C. Richardson of Cleveland are as follows: Samuel Mitchell, Capt. Thomas Wilford, engineer, James Clancey; J. H. Wade, Capt. Charles Swartwood, engineer, George McMonagle; Wm. Chisholm, Capt. Richard Call, engineer, Thomas Blain; J. H. Devereaux, Capt. Simon Gillmore, engineer, A. McDonald; Roumania, Capt. R. J. Cowley, engineer, Edward Prince; Iroquois, Capt. Thomas Jones, engineer Silas Hunter; J. H. Outhwaite, Capt. Louis Stone, engineer, R. A. Davidson. Schooners—J. J. Barlum, Capt. George Brock; H. A. Barr, Capt. John McKeighan.

Masters of the boats of the Anchor Line and Union Steamboat Company appointed for the coming season are as follows: Anchor Line—India, F. O'Neil; China, C. Christie; Japan, H. Cronkheit; Gordon Campbell, A. E. Huff; Alaska, J. Niland; Wissahickon, John McCarthy; Delaware, A. McKenzie; Juniata, D. Ryder; Conestoga, H. O. Miller; Lycoming, L. Wright; Conemaugh, F. Bloom; Lehigh, J. H. Beron; Clarion, J. Corcoran; Codorus, M. Rowan; Mahoning, H. Durker; Schuylkill, John Doherty; Susquehanna, M. Riley. Union Steamboat Company.—Chemung, W. Robinson; Owego, John Byrne; Tioga, A. A. Phelps; H. J. Jewett, D. Bordeaux; Rochester W. P. Garden; New York, J. Clossey; Avon, T. H. Stafford; Portage, S. E. Chatterton; J. C. Ford, S. Scott.

Stocks of Grain at Lake Ports.

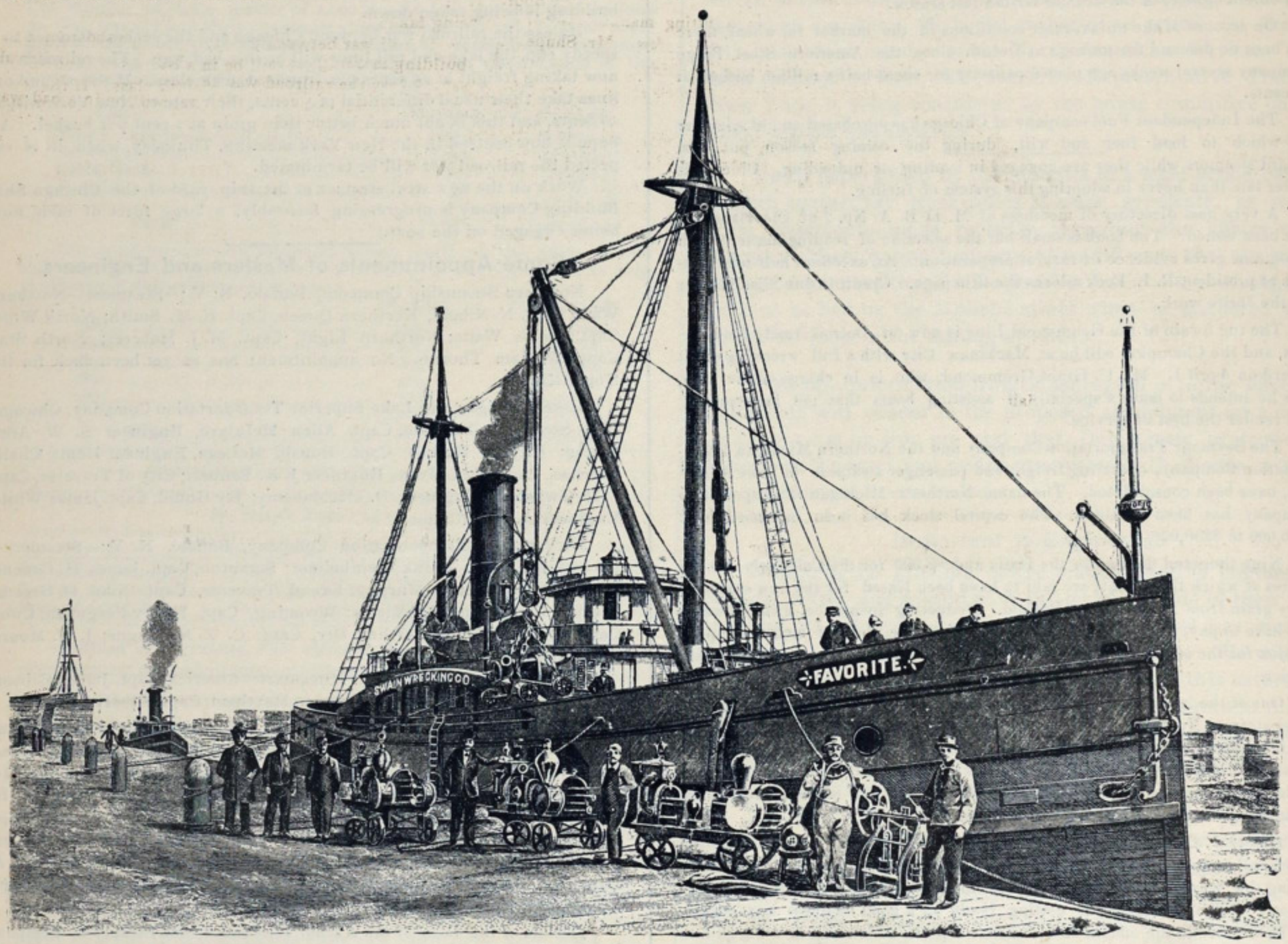
The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on March 10, 1894:

	Wheat, bu.	Corn, bu.
Chicago	20,879,000	5,580,000
Duluth	10,953,000	239,000
Milwaukee	865,000	.....
Detroit	1,817,000	36,000
Toledo	3,046,000	1,158,000
Buffalo	1,400,000	456,000
Total	38,960,000	7,469,000

At the points named there is a net increase for the week of 30,000 bushels of wheat and 422,000 bushels of corn.

Description of a Lake Wrecking Plant.

With the appliances that have been added of late to the wrecking apparatus of the Swain Wrecking Company, controlled in the office of Parker & Millen of Detroit, that company now has an equipment that is fully representative of the best wrecking practice on the lakes. The wrecking steamer Favorite, shown in an engraving on this page, is not a new craft to lake men, but the appliances which she carries make her an object of considerable interest to anyone acquainted with the important undertakings sometimes resorted to by wrecking expeditions for the early release of stranded ships, when a few hours of delay might result in heavy loss to underwriters or owners. The Favorite's station is Cheboygan, Mich., one of the ports in the Straits of Mackinac, and a location best suited for short runs to the dangerous channels where accidents are most numerous.



In addition to the numerous appliances for lightering, temporary repairs, etc., required in a vessel of her kind, the Favorite, of which Capt. Martin Swain is wrecking master, has four steam pumps, ten 100-ton jacks and three hawsers. One of the pumps is a coal and ore pump, another is a 14-inch Worthington, and three throwing 12-inch streams are of the rotary type. The three hawsers are 12, 10 and 9 inches thick. The Swain company's equipment is not, of course, confined to this boat, as they have similar apparatus at Detroit for work on the rivers, but the Favorite's outfit is suited to the most important work on the lakes.

Light Influence of Head Winds.

The performance of the White Star steamer Majestic during one of her recent passages from New York showed, in a curious and interesting manner, how little influence a head wind and sea, short of an actual gale, has in bringing down the speed of vessels of her class, possessed of great tonnage and power. It goes to prove, also, that in a ship carrying no square sail, a fair wind and sea is of much less advantage than are the same conditions from ahead. Less than twenty years ago when 14 knots was considered fast work, a fresh breeze from ahead very quickly brought down the speed fully two knots in square-rigged ships. In one of her last runs eastward, the log of the Majestic records a handsome day's work of 454 miles with a "fresh breeze from the east," but on the day following the big ship did not do more than 455 miles with a "strong wind and rough sea from S.S.W. to W.S.W., or nearly right aft. With "a strong to hard gale and heavy westerly sea," the next day's work is reduced to 452 miles, or two miles less than when wind and sea were ahead. Certain differences of this nature were observable in the Germanic and Britannic fifteen years ago, when their best runs were done in moderate beam winds, but not nearly to the same extent as in the more powerful Majestic and her sister-ship.—Nautical Magazine.

Of Interest to the Fishermen.

By the terms of a law passed by the legislature of the state of New York some time ago, fishing in certain parts of Lake Ontario otherwise than by rod and line was prohibited, and in one case which came before the courts the game and fish protector of the state seized and destroyed some nets found in the lake. In a suit brought to determine the validity of the law, the court of first instance pronounced it unconstitutional, but this decision was reversed in the higher courts of New York, whose action has just been affirmed by the supreme court of the United States. A dissenting opinion, however, has been filed, in which the legislation is condemned as authorizing the destruction of property without judicial process.

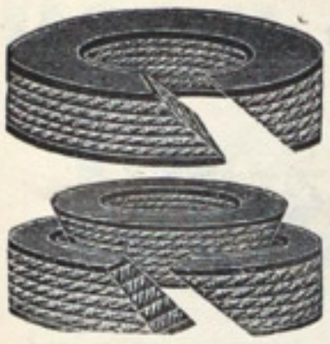
Trade Notes.

The sale of the steamer St. Paul, libeled at Detroit, was adjourned to today, the 17th.

Two large schooners building for H. M. Bean, at Camden, Me., will have their complete outfits of boilers, engines, windlasses, pumps, piping, etc., from the American Ship Windlass Company of Providence, R. I.

As a result of success with the "Cincinnati" automatic steering gear on the steamer John K. Speed, Capt. Laidley has placed an order with Messrs. Crawley & Johnson of Cincinnati to place one of their gears on the new steamer City of Louisville.

Within the past week the Roberts Safety Water Tube Boiler Company has taken orders (among many others) for two large boilers for the new twin-screw steel steamer being built by Marvel of Newburgh; also a boiler for the new 85-foot yacht being built by the Gas Engine and Power Company. The large boiler for the steam yacht Restless of Buffalo is well under way, and the boiler for the quarantine steamer State of New York will probably be shipped this week. The main office of this company has been removed to larger quarters in the Taylor building, 39 and 41 Cortland street, New York City.



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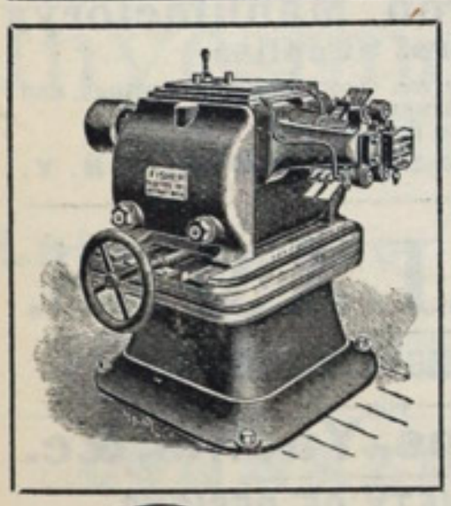

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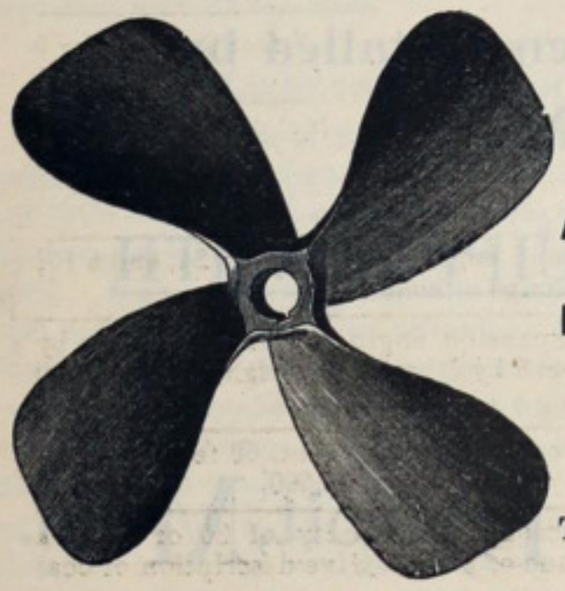

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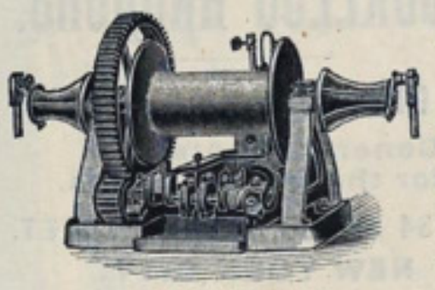

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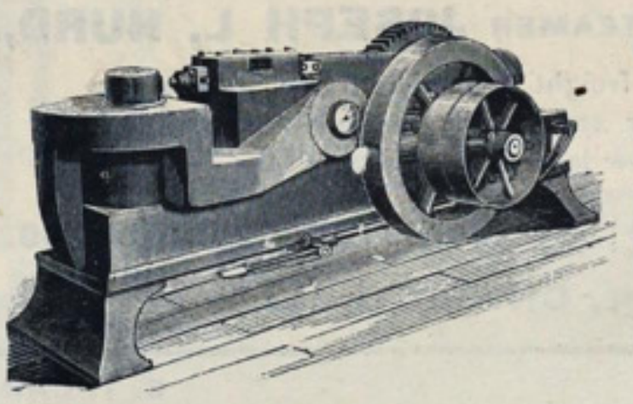

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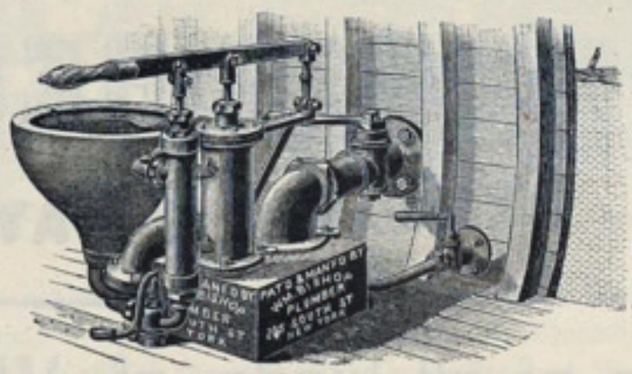

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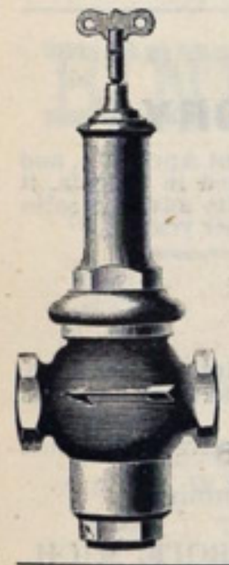

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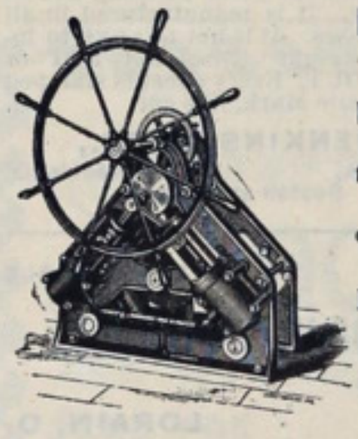

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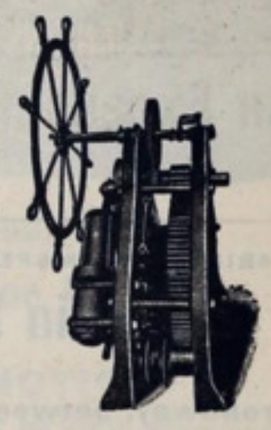

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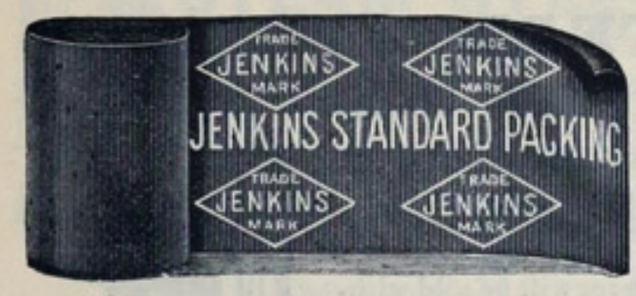

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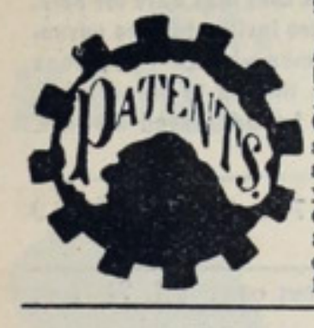

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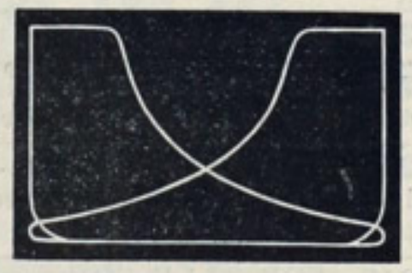

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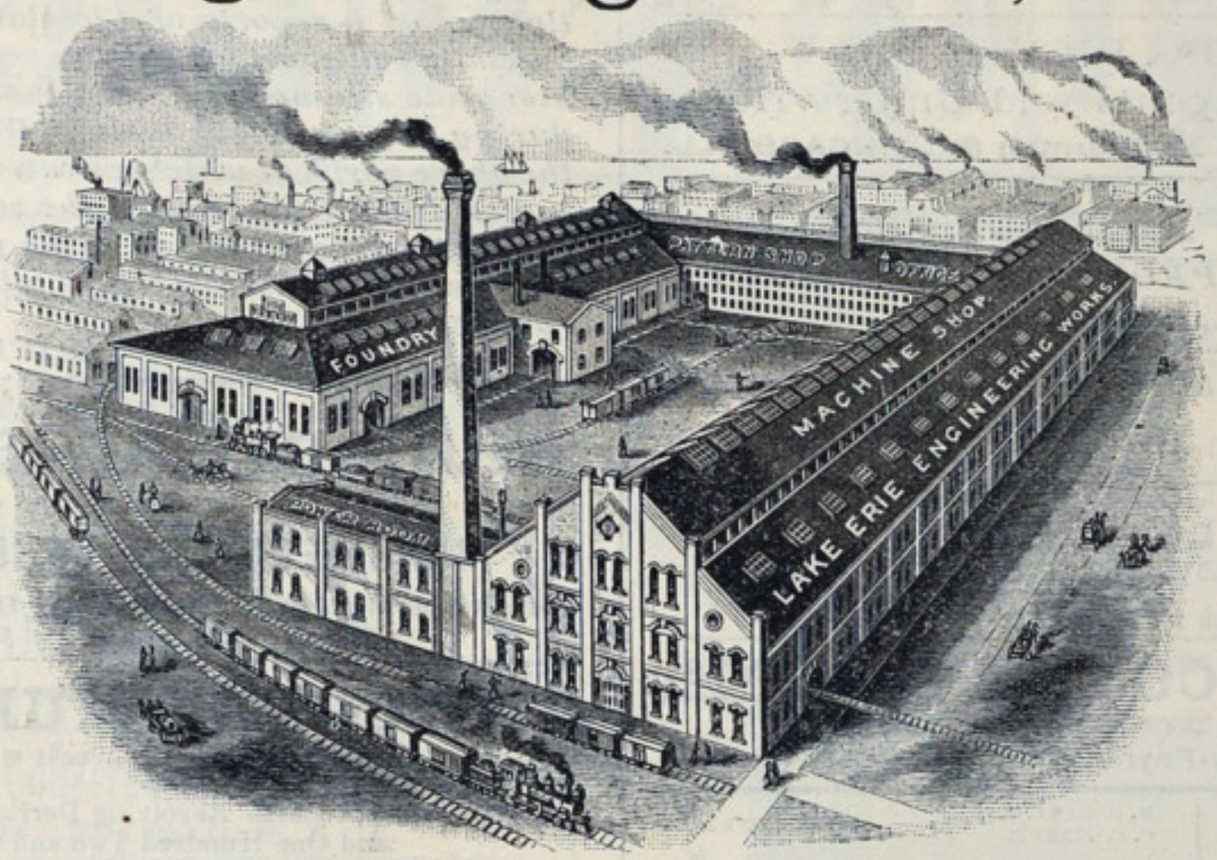

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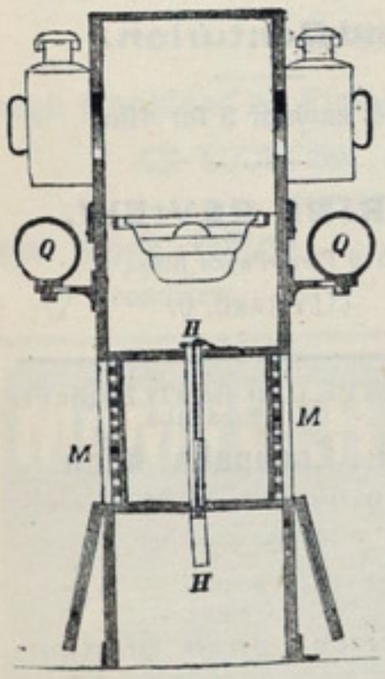

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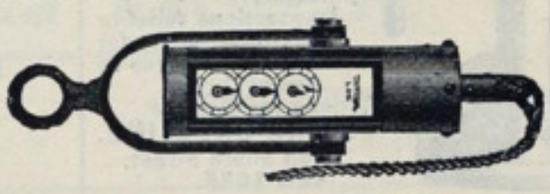

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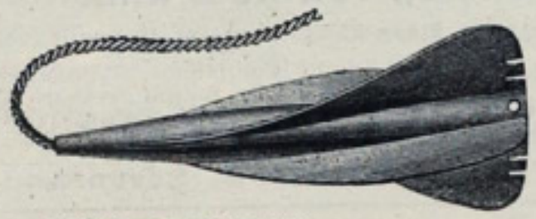

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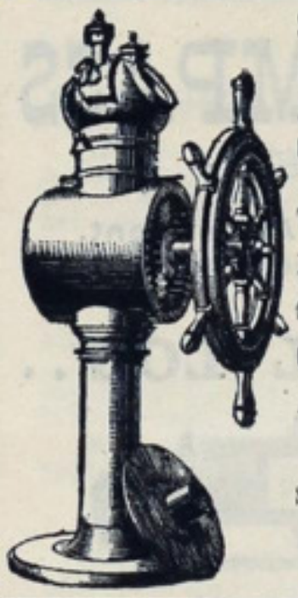

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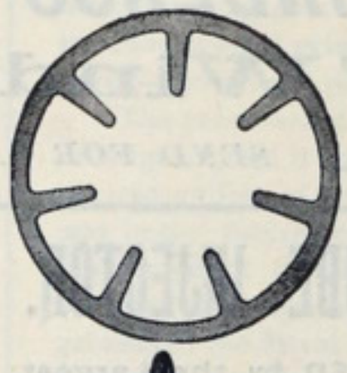

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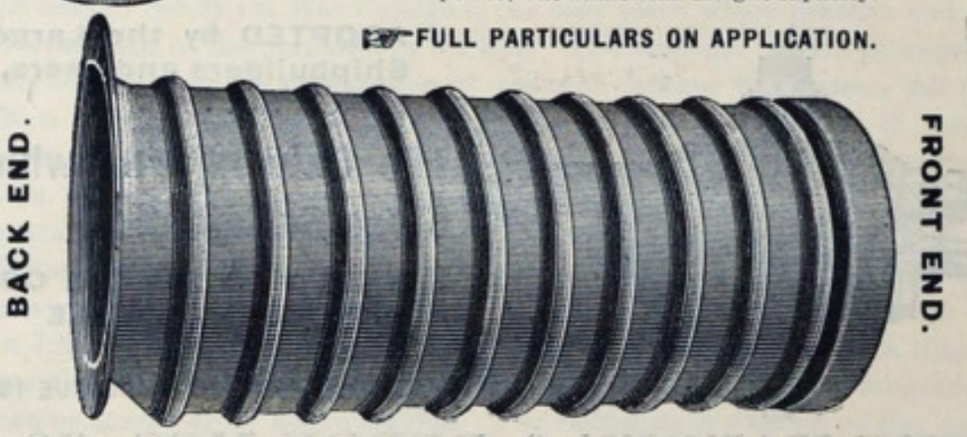

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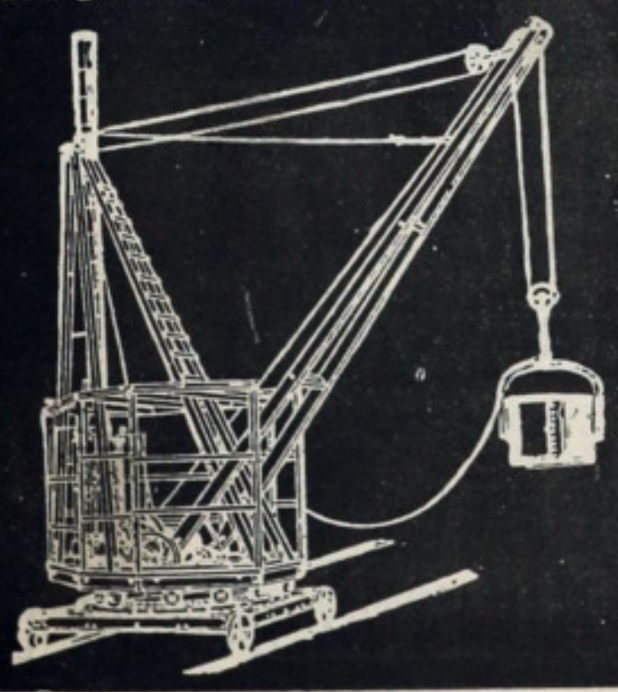

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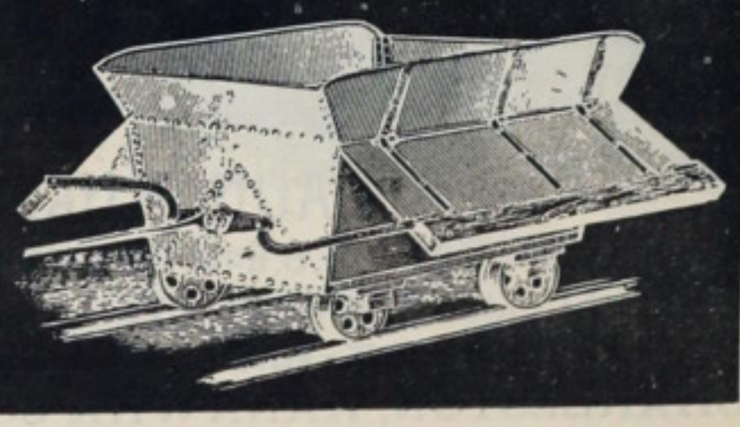

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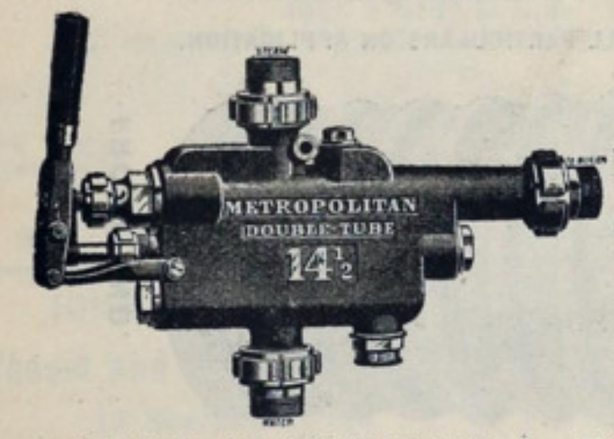

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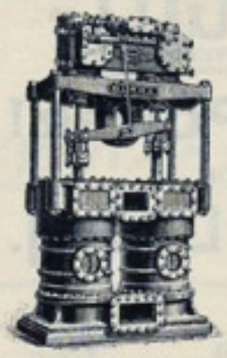

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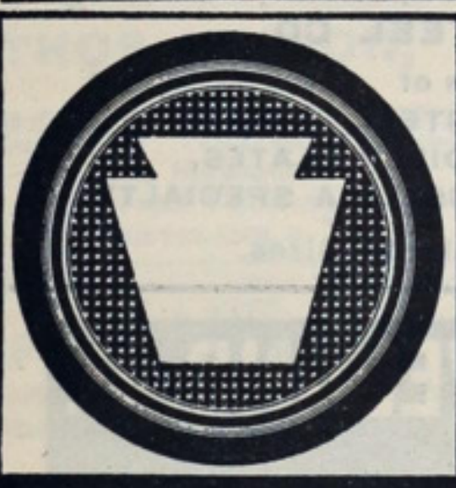

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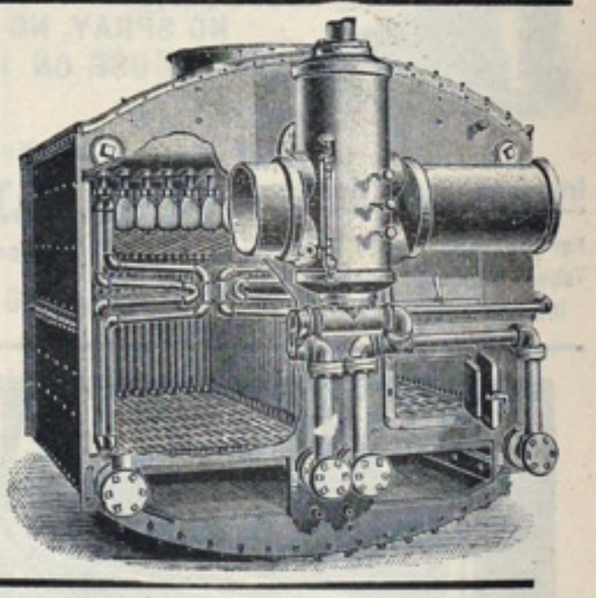

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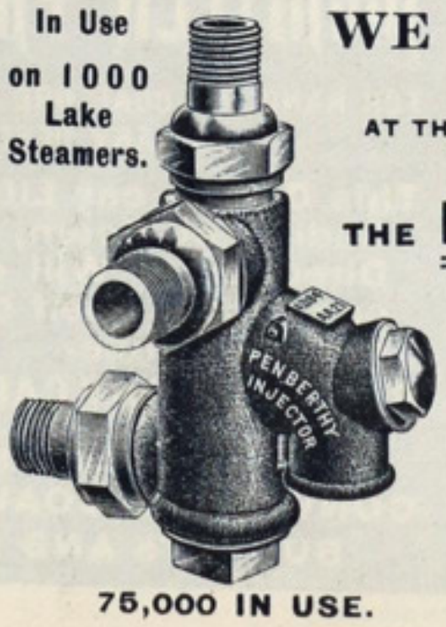

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